OVERTURE SENIOR RESIDENCES

TRAFFIC IMPACT STUDY

EXECUTIVE SUMMARY

Prepared for:

The Town of Chapel Hill

Public Works Department - Engineering

Prepared by:

HNTB North Carolina, PC

343 East Six Forks Road
Suite 200
Raleigh, NC 27609

NCBELS License #: C-1554

December 2017

HNTB

OVERTURE SENIOR RESIDENCES

TRAFFIC IMPACT STUDY

EXECUTIVE SUMMARY

Prepared for:

The Town of Chapel Hill
Public Works Department - Engineering

Prepared by:

HNTB North Carolina, PC

343 East Six Forks Road
Suite 200
Raleigh, NC 27609

NCBELS License #: C-1554

December 2017

NORTH CAROLINA PROFESSIONAL SEAL 026910 ENGINEER CRAIG R SCHEFFLER

12-14-17

EXECUTIVE SUMMARY

Project Overview

A new senior-oriented residential community, known for this study as Overture Senior Residences, is being proposed in Chapel Hill along Homestead Road near its intersection with the Weaver Dairy Road Extension. The project proposes to construct 190 attached residential units with amenities. **Figure ES-1** shows the general location of the site. The project is anticipated to be fully complete by late 2019. This report analyzes the full build-out scenario for the year 2020 (one year after anticipated completion), the no-build scenario for 2020, as well as 2017 existing year traffic conditions.

The proposed site plan shows a provision for a full movement access driveway that connects to Homestead Road and a provision for a cross-access connection in the rear of the site to the Courtyards of Homestead residential development that is currently under construction. No other vehicular access connections are proposed. The main site driveway is proposed to have internal intersections with on-site parking areas. **Figure ES-2** displays the overall site plan of the Overture Senior Residences and nearby land uses and roadways. The site is expected to provide approximately 250 parking spaces on surface lots. This report analyzes and presents the transportation impacts that the Overture Senior Residences will have on the following intersections in the project study area:

- Homestead Road and Seawell School Road
- Homestead Road and Proposed Site Driveway
- Homestead Road and Weaver Dairy Road Extension
- Homestead Road and NC 86 (Martin Luther King, Jr. Boulevard)

The impacts of the proposed site at the study area intersections will be evaluated during the AM, noon, and PM peak hours of an average weekday.

Existing Conditions

Study Area

The site is located in north Chapel Hill along Homestead Road. The study area contains three signalized intersections along Homestead Road at NC 86 (Martin Luther King, Jr. Boulevard), Weaver Dairy Road Extension, and Seawell School Road. All future site traffic is expected use the proposed full access site driveway along Homestead Road. Internal driveways shown on the preliminary site plan will circulate site traffic to designated parking areas and residential buildings.

NC 86 (Martin Luther King, Jr. Boulevard) is a major north-south arterial providing connectivity between downtown Chapel Hill, north and south Chapel Hill, the I-40 corridor and Hillsborough. Homestead Road is a minor east-west arterial providing connectivity through northern Chapel Hill. Remaining study area network roadways are either suburban collector streets or local neighborhood/commercial access streets.

Site Traffic Generation

With the addition of new peak hour trips during the weekday AM, noon, and PM peak hours, there are potential site traffic impacts to the study area intersections. **Table ES-1** shows the site trip generation details, with generation rates taken from the Institute of Transportation Engineers (ITE) *Trip Generation Manual, Version 9*.

Table ES-1
Weekday Vehicle Trip Generation Summary

Description	Density	Daily			AM Peak			Noon Peak			PM Peak		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Senior Adult Housing – Attached (ITE LUC 252)	190 Units	327	327	654	13	25	38	20	24	44	26	22	48

Background Traffic
Background traffic growth for the 2020 analysis year is expected to come from two sources - ambient regional traffic growth and specific development-related traffic growth. Town staff provided information for development-related traffic growth for four Town-approved sites in the north Chapel Hill area near the project study area. All remaining estimated traffic volume increases are assumed to occur due to overall region-wide ambient growth (assumed 1.0 percent per year based on NCDOT/Town provided historic growth data).

Impact Analysis

Peak Hour Intersection Level of Service
Existing traffic operations at all study area intersections are acceptable during all three peak hours analyzed. The projected ambient and background development traffic growth will increase impacts by 2020. Even with the addition of peak hour site-generated trips to the projected 2020 background traffic volumes, no study area intersections are expected to experience deficient traffic operations in any peak hour. Mitigation improvements to the Site Driveway intersection with Homestead Road were considered for safety reasons. A summary of the traffic operations for each intersection, related to vehicular delays (intersection average as a whole if signalized, critical movement if stop-controlled) and the corresponding Level-of-Service (LOS) is shown in **Table ES-2**.

Table ES-2. Peak Hour Intersection Capacity Analysis Summary

Intersections	Peak Hour	2017 Existing		2020 No-Build		2020 Build		2020 Mitigated	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Homestead Road & Seawell School Road	AM	B	13.8	B	15.3	B	15.4	N/A	N/A
	NOON	A	5.5	A	5.7	A	6.7	N/A	N/A
	PM	A	9.4	B	10.5	B	10.6	N/A	N/A
Homestead Road & Weaver Dairy Rd Extension	AM	A	9.0	B	11.0	B	11.1	N/A	N/A
	NOON	A	6.9	B	10.7	B	10.9	N/A	N/A
	PM	B	10.6	B	15.0	C	15.5	N/A	N/A
Homestead Road & Site Driveway#	AM	N/A	N/A	N/A	N/A	C	19.2	C	19.2
	NOON	N/A	N/A	N/A	N/A	B	12.0	B	12.0
	PM	N/A	N/A	N/A	N/A	C	15.9	C	15.8
Homestead Road & NC 86 (MLK Jr, Boulevard)	AM	C	25.7	C	28.6	C	29.3	N/A	N/A
	NOON	C	25.9	C	31.5	D	32.9	N/A	N/A
	PM	C	27.0	C	32.4	D	33.8	N/A	N/A

N/A – Not Applicable or No Improvements Necessary
BOLD/ITALICS – Critical Movement or Overall Intersection Requires Mitigation Per Town TIS Guidelines
- Worst-Case LOS/Delay for Unsignalized/Stop-Controlled Critical Movement

Access Analysis
Vehicular site access is to be accommodated at a proposed full movement access driveway connecting to Homestead Road about 325 feet to the west of its signalized intersection with the Weaver Dairy Road Extension. The driveway has a single inbound lane and outbound lanes. A second driveway access connection is also proposed in the rear of the property to connect to an internal roadway from the Courtyards at Homestead development. The driveway connection to Homestead Road would have a throat length of approximately 400 feet prior to internal parking lot connections and is acceptable, based on 50 foot minimum throat length standards found on Page 69 of the 2017 *Town of Chapel Hill Public Works Design Manual*. Two internal driveway connections to the main site driveway are proposed, with a separation of approximately 475 feet.

Driveway distances along Homestead Road from the signalized intersection at the Weaver Dairy Road Extension is approximately 325 feet as noted above, and is acceptable, based on recommendations of 100 foot minimum corner clearance as set forth in the 2003 *NCDOT Policy on Street and Driveway Access to North Carolina Highways* and the 100 foot minimum along collector streets specified in the Town Design Manual. The distance between the proposed driveway connection and the Courtyards at Homestead site access driveway is approximately 450 feet and would also be acceptable, based on the recommended 50 foot spacing along collector roadways found in Table 3.2 – Street Standards in the Town Design Manual.

Access for pedestrians is adequate in the project study area. Sidewalk is present on the south sides of Homestead Road east of the site and is planned along the site frontage on the south side of Homestead Road connecting to sidewalk along the Courtyards of Homestead development. Sidewalk connectivity is not present along Homestead Road on the north side of the road and further to the west of the site. Crosswalk exists across the NC 86 and Weaver Dairy Extension intersections with Homestead Road signalized intersections and across Homestead Road at Northern Park Drive to the east of the Overture Senior Residences site. No specific bicycle amenities are present along Homestead Road, but bicycle lanes are present on one side of Seawell School Road and the Weaver Dairy Road Extension and along NC 86 north of Homestead Road. The site is adjacent to the Horace Williams Greenway and is proposing an unpaved pedestrian/bicycle path at the rear of the site.

Signal Warrant Analysis
Based on projected 2020 traffic volumes and proposed access plans, the unsignalized Site Driveway intersection with Homestead Road would not warrant the installation of a traffic signal, based on the methodology found in the *2009 Manual on Uniform Traffic Control Devices (MUTCD).*

Crash Analysis
Data from the NCDOT Traffic Safety Unit was provided for the five-year period 9/1/2012 to 8/31/2017 for the segment Homestead Road in the vicinity of the proposed site. There were 29 crashes reported along Homestead Road study area corridor between Seawell School Road and NC 86 over the five year period. The primary crash type was rear end crashes and crashes were primarily clustered near the NC 86 intersection. Overall, the number and severity of crashes along Homestead Road in the project study area is lower than state-wide averages for similar facilities. There was one pedestrian fatality recorded near the Seymour Senior Center to the east of the Overture site.

Other Transportation-Related Analyses
Other transportation-related analyses relevant to the 2001 Town of Chapel Hill Guidelines for the preparation of Traffic Impact Studies were completed as appropriate. The following topics listed in **Table ES-3** on the following page are germane to the scope of this study.

Table ES-3. Other Transportation-Related Analyses

Analysis	Comment
Turn Lane Storage Requirements	Storage bay lengths at study area intersections were analyzed using Synchro and HCS 95th percentile (max) queue length estimates for the 2020 Build Scenario. No recommendations for improvements to storage bays are expected, based on the analysis results. At the intersection of Homestead Road and NC 86 (Martin Luther King, Jr. Blvd), projected 95th percentile queue lengths may exceed the northbound and eastbound existing delineated storage bay lengths if existing signal timings are not adjusted to reflect expected increases in traffic volumes related to those movements.
Appropriateness of Acceleration/ Deceleration Lanes	The site concept plan shows no specifics related to acceleration/deceleration lanes. It is recommended that a westbound left-turn lane be constructed along Homestead Road at the proposed site driveway to remove turning traffic movements from the westbound through traffic flow along Homestead Road. No other specific acceleration/deceleration lane issues were analyzed in the project study area.
Pedestrian and Bicycle Analysis	Existing pedestrian access and connectivity is adequate along the Homestead Road corridor adjacent to the site, though some gaps exist on both sides of the road in certain areas. Sidewalk exists along thoroughfares connecting to Homestead Road on at least one side of the road. Bicycle lanes extend along NC 86 north of Homestead Road and along the Weaver Dairy Road Extension and Seawell School Road, but no bicycle facilities exist along Homestead Road within the project study area. The site plan shows a sidewalk across the Homestead Road frontage, allowing a direct connection to the Horace Williams Greenway, along with an unpaved path at the rear of the site.
Public Transportation Analysis	Public transportation service to the study area, and to the proposed site is adequate, with bus stops and multiple local and regional bus routes on both NC 86 and Homestead Road proximate to the site

Mitigation Measures/Recommendations

Planned Improvements

There are no Town of Chapel Hill or North Carolina Department of Transportation improvement projects for study area roadway facilities within the analysis year time frame of 2017-2020.

Background Committed Improvements

There are no specific geometric improvements to the study area roadway intersections related to background private development projects that are expected to be completed between 2017 and 2020. Several traffic impact studies for development projects in and near the study area recommended signal timing reoptimization for signalized intersections along the NC 86 (Martin Luther King, Jr. Blvd) corridor by their respective build-out years. It is assumed that signal timing reoptimization will occur for the NC 86 corridor by the year 2020, whether or not specifically needed by any of the proposed background traffic generating developments included in this study.

Applicant Committed Improvements

Based on the preliminary site plans and supporting development information provided, there are no specific transportation-related improvements proposed external to the Overture Senior Residences site. There are several internal improvements including the following:

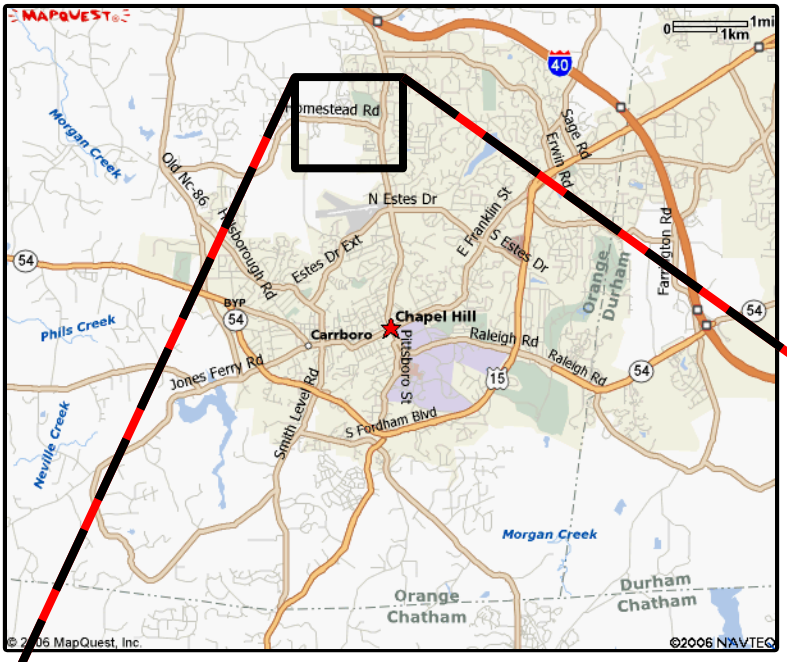
- Provision of cross-access connection to adjacent Courtyards at Homestead development
- Construction of continuous sidewalk along south side of Homestead Road across site frontage
- Construction of an unpaved pedestrian path at rear of site to connect to trail system within Carolina North

Necessary Improvements

Based on traffic capacity analyses for the 2020 design year, and analyses of existing study area turning bay storage lengths and site access, the following improvements are recommended as being necessary for adequate transportation network operations (see **Figure ES-3**).

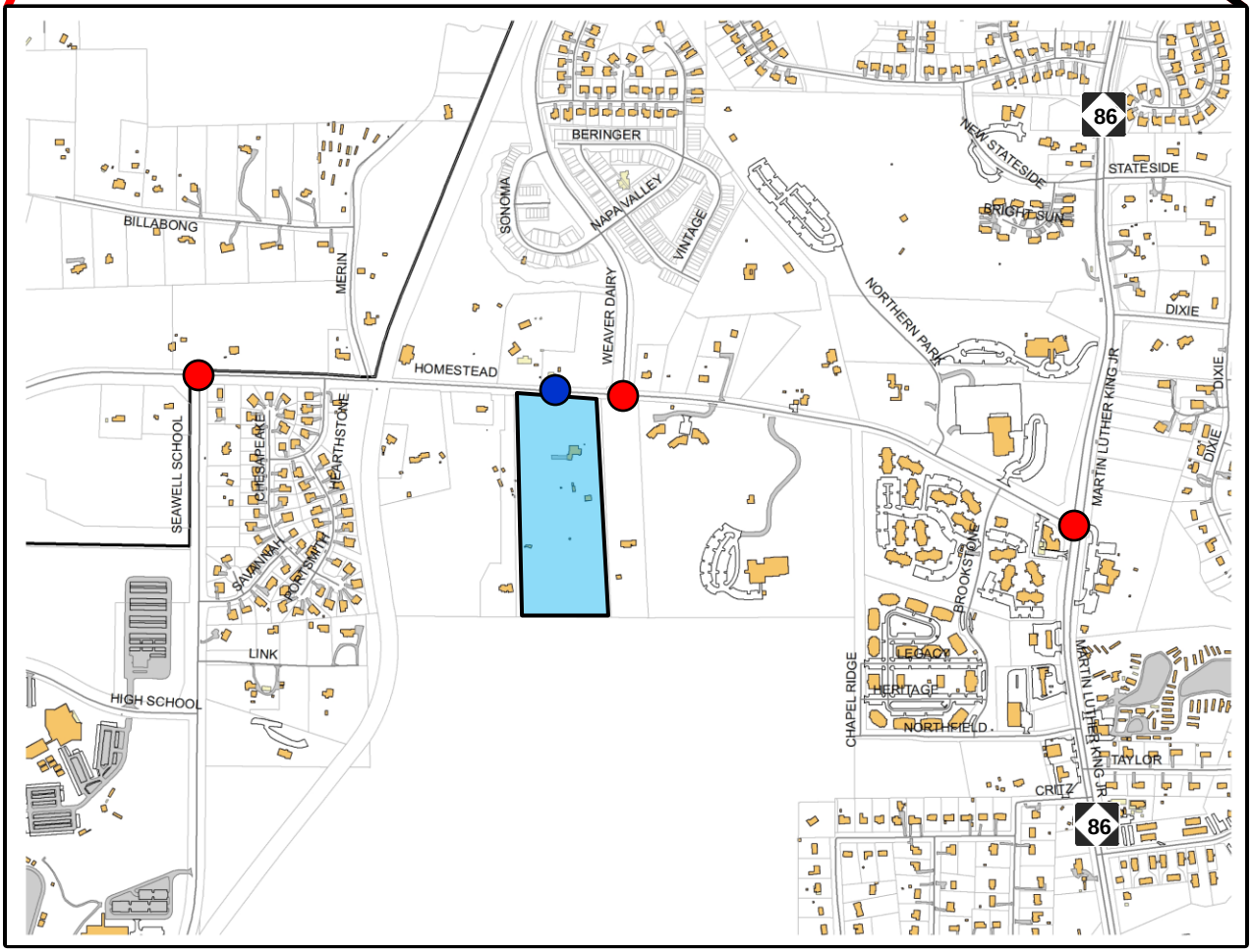
1) Retime the NC 86 (Martin Luther King, Jr. Blvd) and Homestead Road intersection to optimize overall capacity given the existing intersection geometrics and progression along NC 86. Also, retime the signal to potentially reduce projected vehicle queues on the eastbound Homestead Road approach and northbound NC 86 left-turn lanes that may exceed existing storage capacity. This improvement is recommended whether or not if the Overture Senior Residences site is developed.

2) Widen Homestead Road along the length of site frontage to provide a consistent three-lane cross-section with an exclusive westbound left-turn lane into the site with 100 feet of vehicular storage. This also may allow the extension of the existing eastbound left-turn lane at the Weaver Dairy Road Extension for additional storage (125 feet total or more depending on taper design). This improvement is recommended due to the Overture Senior Residences development.



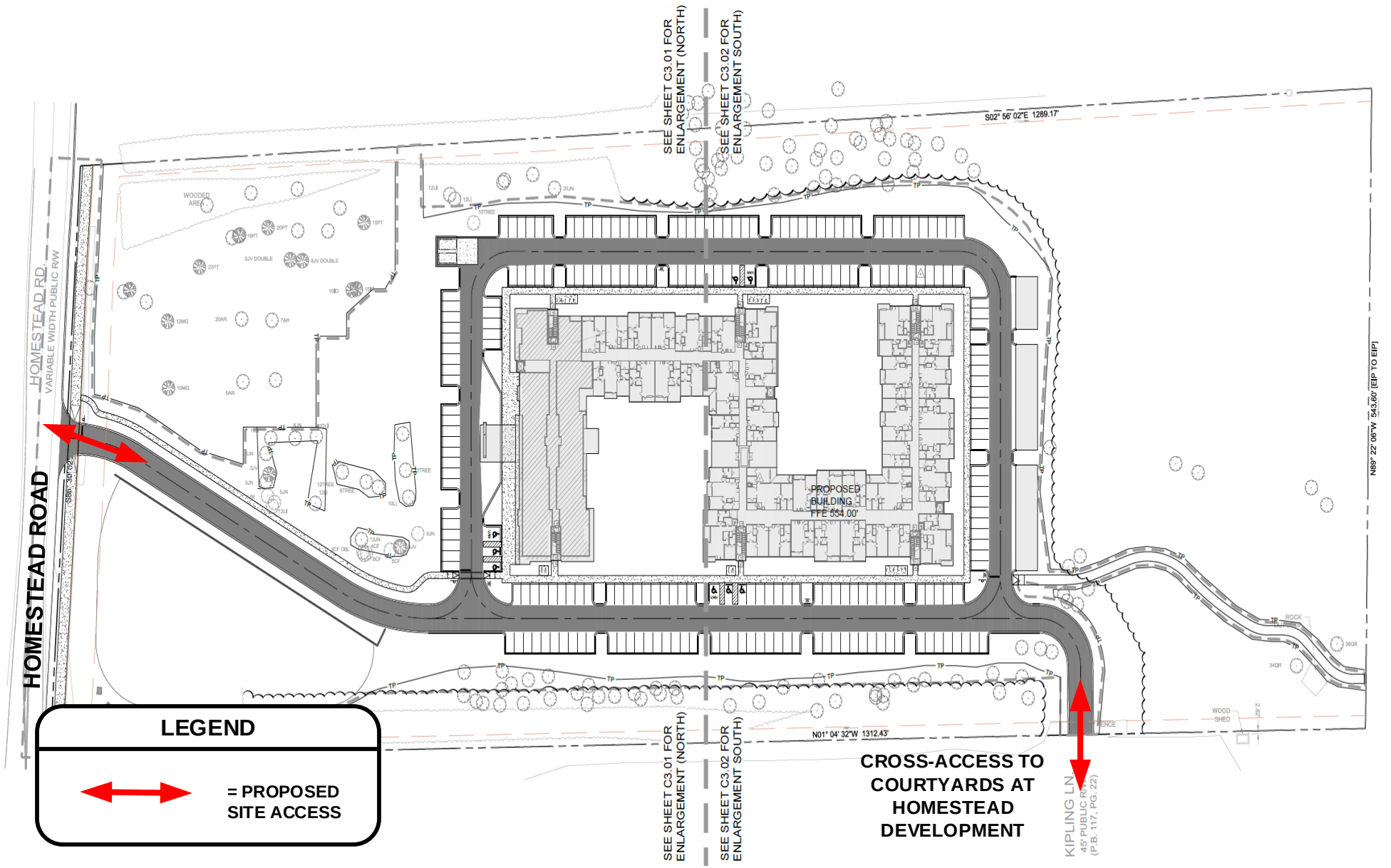
LEGEND

- = Existing Building Footprint
- = Existing Study Area Intersection
- = Proposed Site Driveway
- = Proposed Site Parcel



Source: Town of Chapel Hill GIS Files

HNTB / TOWN OF CHAPEL HILL	**Overture Senior Residences** **Traffic Impact Study**	**DATE:** December 2017
	PROJECT STUDY AREA	**FIGURE ES-1**



HNTB

TOWN OF CHAPEL HILL

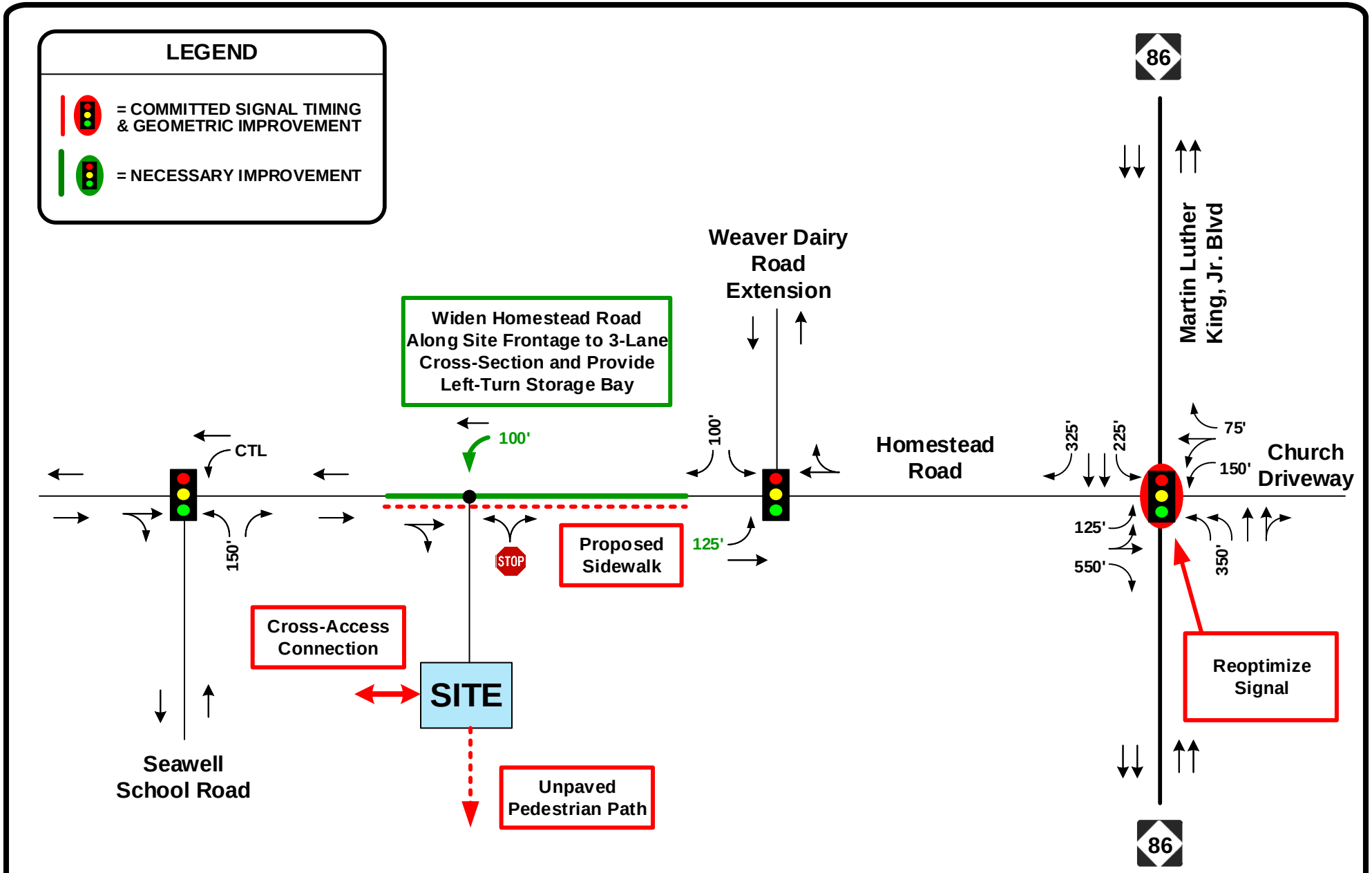
NOT TO SCALE

Overture Senior Residences
Traffic Impact Study

DATE: December 2017

PRELIMINARY SITE PLAN

FIGURE ES-2



HNTB	TOWN OF CHAPEL HILL	N	**Overture Senior Residences** **Traffic Impact Study**	**DATE:** December 2017
		NOT TO SCALE	**COMMITTED AND RECOMMENDED IMPROVEMENTS**	**FIGURE ES-3**